UNITED STATES-INDIA EDUCATIONAL FOUNDATION

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2021-2022 Indian Fellows

Sanjib Kumar Agarwalla

Grant Category:	Fulbright-Nehru Academic & Professional Excellence Award (Research)
Project Title:	Exploring Fundamental Properties of Massive Neutrinos
Field of Study:	Physical Sciences
Home Institution:	Institute of Physics (IOP), Bhubaneswar, Odisha
Host Institution:	University of Wisconsin-Madison, Madison, WI
Grant Start Month:	March, 2022
Duration of Grant:	Nine months

Brief Bio:

An associate professor at the Institute of Physics, Bhubaneswar, Prof. Sanjib Kumar Agarwalla's field of specialization is High Energy Particle Physics. An internationally prominent and well-recognized expert in neutrino physics, he is a Swarnajayanti Fellow of the Department of Science and Technology (DST), Govt. of India; a Simons Associate of the International Centre of Theoretical Physics (ICTP), and the sole winner of the prestigious B. M. Birla Science Prize in Physics, 2018. He obtained his PhD from the University of Calcutta, Kolkata in 2009 and subsequently performed postdoctoral studies in the Physics Department at Virginia Tech, USA and the Instituto de Física Corpuscular (IFC) at the University of Valencia, Spain.

Several world-class experiments have firmly established neutrino flavor oscillation, implying that neutrinos have mass, and they mix with each other. Since neutrinos are massless in the basic Standard Model (SM) of particle physics, we need to invoke physics beyond the Standard Model (BSM) to accommodate non-zero neutrino mass and mixing. Many models of BSM physics suggest the existence of new fundamental particles and interactions, new sources of CP-invariance violation, lepton number, and lepton flavor violations.

During his Fulbright-Nehru research fellowship, Prof. Agarwalla is performing a rigorous test of the three-flavor neutrino oscillation framework and probing various above-mentioned BSM scenarios in the context of currently running and upcoming high-precision long-baseline and atmospheric neutrino oscillation experiments. He is also studying the role of high-energy cosmic neutrinos detected by the IceCube Neutrino

Observatory at the South Pole to reveal new fundamental particles and interactions, probing energy and distance scales far exceeding those accessible in the laboratory.

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